IN-ROADWAY, ILLUMINATED MARKER SYSTEM

1.0 GENERAL VENDOR REQUIREMENTS

1.1 AGENCY CONTRACT FOR THE PURCHASE OF ILLUMINATED IN-ROADWAY MARKER SYSTEM, CONTROLLER CABINET, AND UPS SYSTEM.

1.2 PRICES TO INCLUDE ALL EQUIPMENT, TOOLS, AND NECESSARY INCIDENTALS FOR THE INSTALLATION OF THE EQUIPMENT AND SYSTEMS ABOVE.

1.3 THE UPS SYSTEM SHALL HAVE BEEN PRE-APPROVED PRIOR TO CONTRACT AWARD AND SHALL BE FOUND LISTED IN THE ALABAMA DEPARTMENT OF TRANSPORTATION'S APPROVED PRODUCTS LISTING. THIS INFORMATION CAN BE FOUND UNDER THE "APPROVED TRAFFIC CONTROL DEVICES AND MATERIALS" LISTING, SECTION "IV-2 INDIVIDUAL TRAFFIC SIGNAL ITEMS", SUB-SECTION "UPS/POWER BACK-UP SYSTEMS" ON THE PAGE LINK BELOW:

http://www.dot.state.al.us/Docs/Bureaus/Materials+and+Tests/Testing/MSDSAR/MSDSAR_lists.htm

2.0 ILLUMINATED IN-ROADWAY MARKER SYSTEM

2.1 THE SYSTEM SHALL BE COMPRISED OF 28 RED ILLUMINATED IN-ROADWAY MARKERS (INCLUDES 2 SPARES), 1600' OF POWER AND COMMUNICATION CABLING, AND A NEMA COMPATIBLE CONTROLLER.

2.2 THE ILLUMINATED MARKERS SHALL BE ALUMINUM OR STAINLESS STEEL ENCASED, UNIDIRECTIONAL, WITH RED LEDS PROTECTED BY A HARDENED GLASS LENS. MARKERS SHALL HAVE NO PLASTIC COMPONENTS EXPOSED TO TRAFFIC. SHALL HAVE A MINIMUM OF 500' VISIBILITY DURING DAYLIGHT HOURS. DIRECT WIRED TO THE CONTROLLER FOR BOTH POWER AND CONTROL. OPERATED ON 24 – 48 VDC. THE MARKERS SHALL BE IP ADDRESSABLE OR INDIVIDUALLY ACCESSIBLE THROUGH THE CONTROLLER TO DETERMINE THE STATE AND STATUS OF THE MARKER (ACTIVATED OR NOT, INOPERABLE, ETC.).

2.3 THE CONTROLLER SHALL BE NEMA COMPLIANT AND CAPABLE OF OPERATING ALL ILLUMINATED MARKERS AS A SINGLE UNIT OR IN ANY NUMBER OF USER CONFIGURABLE SETS. THE CONTROLLER SHALL BE ABLE TO DETERMINE THE STATE AND STATUS OF EACH MARKER OR SET OF MARKERS. IT SHALL HAVE THE CAPABILITY OF OPERATING EITHER ON AC AND/OR DC POWER. THE CONTROLLER SHALL BE CAPABLE OF PROVIDING AN AUTO-DIMMING FEATURE FOR THE ROADWAY MARKERS. OPERATION OF THE CONTROLLER SHALL BE ACCOMPLISHED THROUGH A MENU BASED OPERATION UTILIZING A GRAPHICS DISPLAY ON THE CONTROLLER, AS-WELL-AS, HAVING THE CAPABILITY OF OPERATION THROUGH A REMOTE ACCESS CONNECTION. CONTROL SHALL CONSIST OF THE OPERATION, MONITORING, AND DIAGNOSTICS OF THE CONTROLLER. SHALL BE ABLE TO SET UP USER CONFIGURABLE EVENTS WITH

TIME AND DATE STAMP LOGGING ALONG WITH USER CONFIGURABLE ALARM ACTIONS (EG. TEXT MESSAGE, E-MAIL, ETC.). THE CONTROLLER SHALL INCLUDE AN INTERNAL, REAL-TIME CLOCK.

2.4 THE NORMAL OPERATION OF THE MARKERS SHALL BE A STEADY-BURN WHEN ACTIVATED. A SLOW-PULSE OPERATION SHALL BE ESTABLISHED TO INDICATE WHEN A PROBLEM HAS BEEN ENCOUNTERED (MARKER OUT, DETECTOR OUT, POWER FAILURE, ETC.). THE SLOW-PULSE PATTERN SHALL BE AS FOLLOWS: PULSE TO FULL ON AND HOLD FOR ½ SECOND, FADE FROM FULL ON TO FULL OFF OVER A 2 SECOND INTERVAL, REMAIN IN FULL OFF FOR ½ SECOND. TOTAL CYCLE LENGTH SHOULD BE 3 SECONDS.

2.5 CABLING REQUIRED TO POWER AND CONTROL THE IN-ROADWAY ILLUMINATED MARKERS SHALL BE SUITABLE FOR PLACEMENT INTO AN ASPHALT ROADWAY AS WELL AS DIRECT BURIAL INTO SOIL. THE CONTROL AND POWER TO THE ILLUMINATED MARKERS SHALL BE ACHIEVED THROUGH SEPARATE CONDUCTORS.

2.6 REMOTE COMMUNICATION WITH THE CONTROLLER SHALL BE OBTAINED THROUGH SERIAL, 10/100 ETHERNET (RJ45) AND MODEM (HARD WIRED OR WIRELESS).

3.0 CONTROLLER CABINET

3.1 SHALL BE A NEMA TYPE 3R, BASE MOUNT, ALUMINUM CABINET WITH A THERMOSTATICALLY CONTROLLED POWER VENT FAN. EQUIPPED WITH A TRAFFIC INDUSTRY CONVENTIONAL LOCK OPERATED WITH A #2 KEY. SHALL CONTAIN A MINIMUM OF TWO SHELVE AND OF SUFFICIENT SIZE TO ACCOMMODATE THE CONTROL EQUIPMENT FROM THE ILLUMINATED IN-ROADWAY MARKER SYSTEM AND PERTINENT COMMUNICATION EQUIPMENT SUCH AS MODEMS AND THE LIKE. SHALL BE CAPABLE OF ACCOMMODATING ADDITIONAL EQUIPMENT SUCH AS AN ADDITIONAL CARD-RACK AND THE LIKE.

3.2 THE CABINET SHALL BE EQUIPPED WITH A LOW-POWER LIGHT FIXTURE, FLORESCENT OR LED-STRING, MOUNTED ON THE INSIDE TOP OF THE CABINET NEAR THE FRONT EDGE. THE LIGHT SHALL BE CONTROLLED WITH A DOOR ACTUATED SWITCH THAT TURNS THE LIGHT OFF WHEN THE DOOR IS CLOSED.

3.3 TWO, DUPLEX, THREE PRONG, NEMA TYPE 5 – 15R GROUNDING TYPE RECEPTACLES SHALL BE INSTALLED. THESE RECEPTACLES SHALL HAVE INDEPENDENT GROUND FAULT CIRCUIT PROTECTION.

3.4 GROUNDING AT THE CABINET SHALL BE ACHIEVED THROUGH THE DRIVING OF A COPPER CLAD, 5/8 INCH DIAMETER ROD DRIVEN INTO THE GROUND UNTIL THE MEASURED RESISTANCE IS LESS THAN 25 OHMS (Ω). THE GROUNDING ROD

SHALL BE ENCLOSED WITHIN PVC PIPING AS IT PASSED THROUGH THE CABINET SLAB.

3.5 AN ALUMINUM IDENTIFICATION PLATE SHALL BE AFFIXED TO THE CABINET DOOR. THE PLATE SHALL BE SIZED TO PROVIDE THE MESSAGE "ALABAMA DEPARTMENT OF TRANSPORTATION" EITHER ETCHED OR EMBOSSED IN 1 INCH HIGH LETTERS. THE LETTERS SHALL BE DELINEATED IN BLACK ENAMEL.

3.6 A 20 AMP CIRCUIT BREAKER SHALL BE FURNISHED WITH THE CABINET. THE CIRCUIT BREAKER SHALL ONLY TURN OF THE POWER TO THE CABINET AND SHALL NOT BE USED AS THE POWER SWITCH WITCH IS LOCATED AT THE SERVICE POWER POLE.

4.0 TRAINING/SUPPORT

4.1 THE VENDOR SHALL PROVIDE UP TO A TOTAL OF 2 DAYS SUPPORT WHEN EQUIPMENT IS BEING INSTALLED BY ALDOT PERSONNEL.

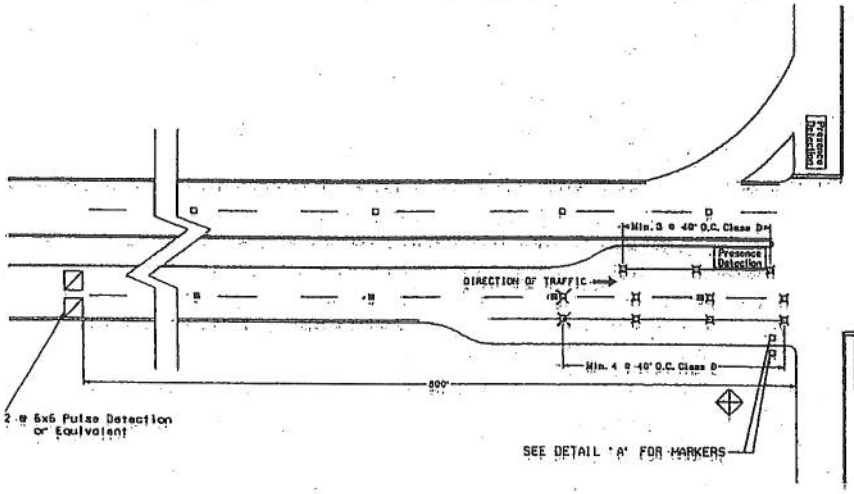
4.2 ONE DAY OF TRAINING SHALL BE PROVIDED FOR THE INSTALLATION & OPERATION OF THE ILLUMINATED, IN-ROADWAY MARKERS SYSTEM.

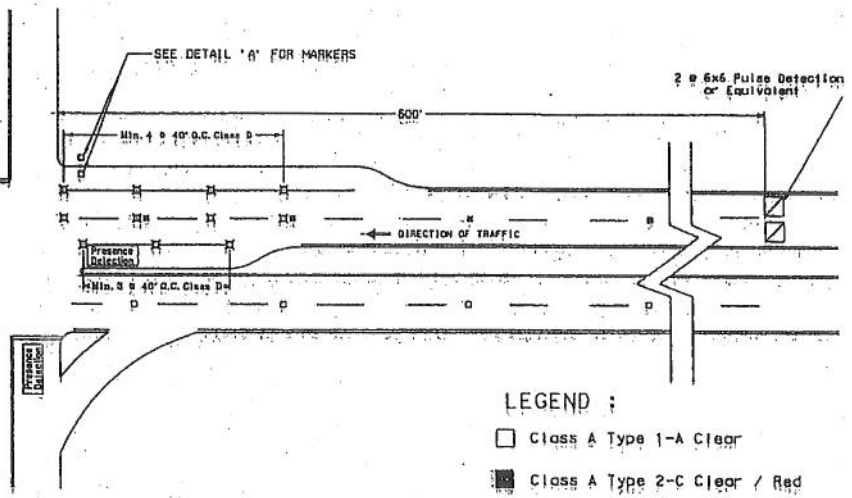
REFERENCE PROJECT NO.	FISCAL YEAR	SHEET NO.

NOTES;

1) REFLECTIVE PAVEMENT MARKERS PLACED ON CENTERLINE SHALL BE LOCATED APPROXIMATELY AT MIDPOINT BETWEEN THE ENDS OF BROKEN LINE TRAFFIC STRIPE AT 40' OR 80' INTERVALS AS SHOWN.
2) WHERE APPLICABLE, CLASS "D" MARKERS SHALL BE PLACED DOWNSTREAM OF CLASS "A" MARKERS. SEE SPECIAL DRAWING MB-2008-02 FOR CLASS "D" OPERATION PLAN
3) CLEAR MARKER FACE IS VIEWED BY TRAFFIC PROCEEDING IN THE PROPER DIRECTION. RED MARKER FACE IS VIEWED BY TRAFFIC PROCEEDING IN THE WRONG DIRECTION. RED MARKER FACE OF TYPE CLASS "D" IS VIEWABLE BY TRAFFIC IN CLOSE PROXIMITY TO AN APPROACH WHERE A WRONG DIRECTION MOVEMENT IS POSSIBLE.
4) IF INSUFFICIENT PAVEMENT WIDTH EXISTS FOR PLACEMENT OF TYPE "D" MARKER ON OUTSIDE (SHOULDER SIDE) OF EDGELINE AS SHOWN IN DETAIL "A", ONE SUBSTITUTIONAL CLASS "D" MARKER SHALL BE INSTALLED UPSTREAM OF THE INSIDE CLASS "D" MARKER AS SHOWN.

(Not To Scale)

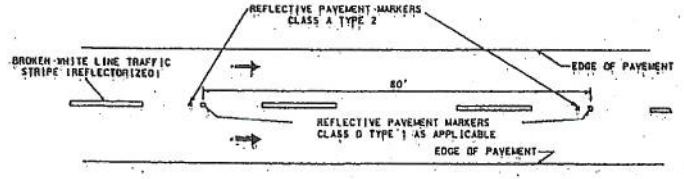




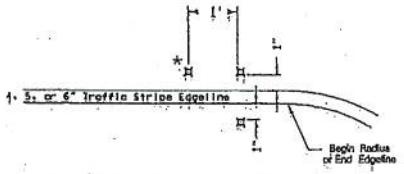
LEGEND ;

- Class A Type 1-A Clear
- Class A Type 2-C Clear / Red
- Class D Type 1-C Red (PROPOSED) Internally Illuminated
- Presence Detection
- 6 X 6 Pulse Detection or Equivalent

SPECIAL APPLICATION OF CLASS A TYPE 2-C & CLASS D TYPE 1-C PAVEMENT MARKERS



SCHEME SHOWING REFLECTIVE AND/OR INTERNALLY ILLUMINATED PAVEMENT MARKERS WHEN USED TO SUPPLEMENT TRAFFIC LINE STRIPE



Right Turn Lane Edgeline Application of Type D Markers

* SEE SUBSTITUTION NOTE 4

DETAIL "A"

PROPOSED SPECIFICATION
Alabama Department of Transportation

REVISIONS

ALABAMA DEPARTMENT OF TRANSPORTATION
1409 COLISEUM BOULEVARD
MONTGOMERY, AL 36130-3050

Maintenance Bureau Special Drawing

Details of Dynamic Internally Illuminated RPM at Intersections of 4 Lane Divided Highways

DRAWN BY:
DATE DRAWN: 7-17-2008

SPECIAL DRAWING NO.: MB - 2008-01

INDEX NO.: 0000